AMAT
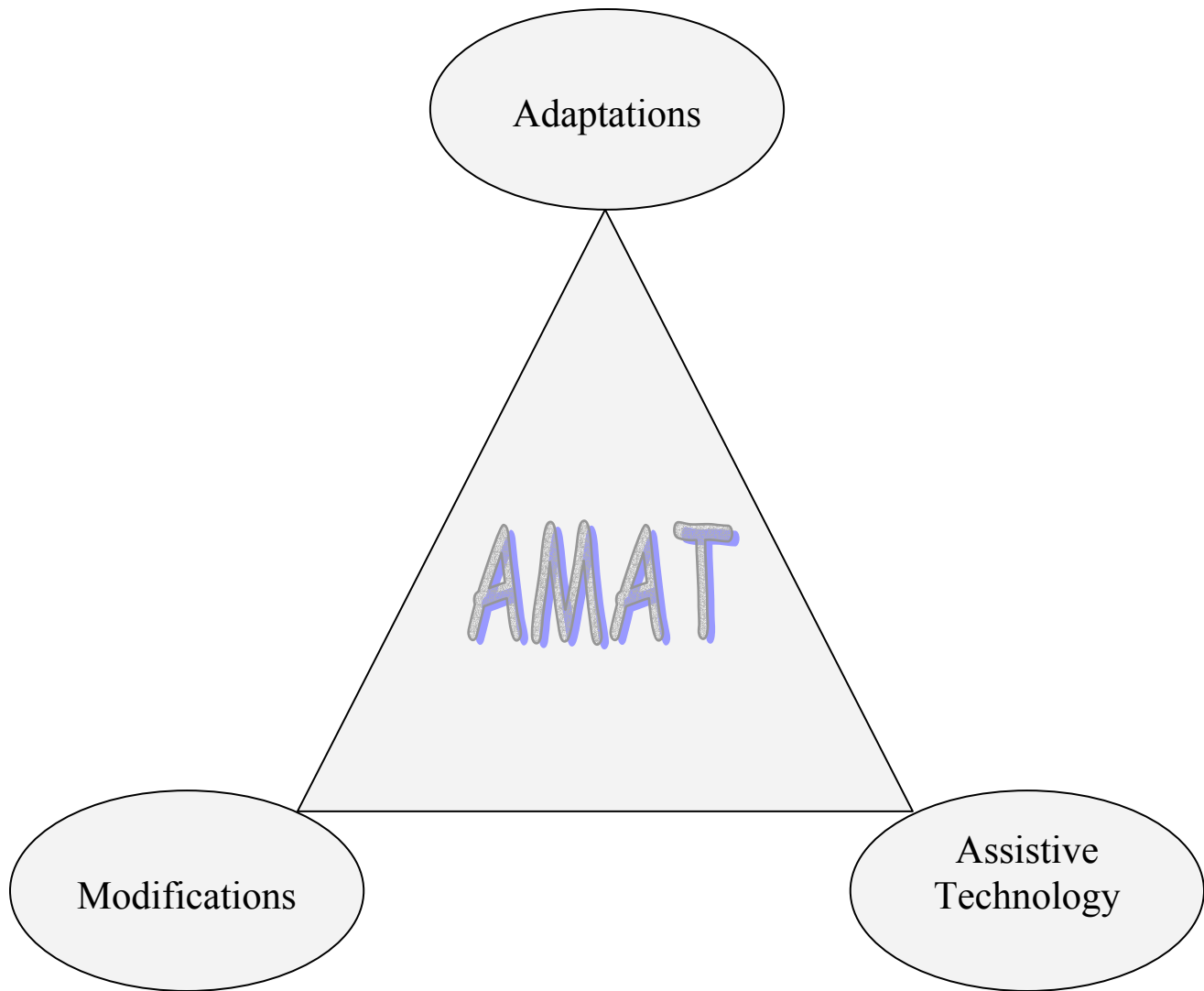# Pulling It All Together

Developed by
Inclusive Large Scale Standards and Assessment Group
University of Kentucky
2004

Assistive Technology Module

In response to findings of United States Congress, The Technology-Related Assistance for Individuals with Disabilities Act Amendments of 1994 was passed which supported the use of assistive technology for persons with disabilities. These findings report: "Disability is a natural part of the human experience and in no way diminishes the right of individuals to:

> (A) live independently;
> (B) enjoy self-determination;
> (C) make choices;
> (D) pursue meaningful careers; and
> (E) enjoy full inclusion and integration in the economic, political, social, cultural, and educational mainstream of American society.

This was further supported by the Individuals with Disabilities Education Act amended in 1997 (IDEA 97) which requires the Individual Education Team (IEP) to determine if the child requires assistive technology devices and services. Even with this focus placed on assistive technology, some students are not afforded appropriate devices and services to attain the rights noted by congress, including access to the general curriculum mandated by IDEA 97.

Definition of Assistive Technology

The legislation that initially defined assistive technology was the Technology-Related Assistance for Individuals with Disabilities Act of 1988. The definition was modified only slightly, and included in the Individuals with Disabilities Education Act (IDEA) of 1990. It reads:

Assistive technology device: The term "assistive technology device" means any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities.

Assistive technology service: The term "assistive technology service" means any service that directly assists an individual with a disability in the selection, acquisition, or use of an assistive technology device.

The definition is very broad, often leading to confusion. There is a debate in the field as to whether simple physical adaptations (e.g., pencil grip) or computer assisted instruction, are assistive technology (AT). Additionally, Iowa's Assistive Technology Manual (Field Version 1998) states that assistive technology can also take the form of adaptations and modifications. The Iowa Alternate Assessment Educator's Guide (2003) defines:

- adaptations as "changes made to existing materials or instructional delivery in order to meet the needs of a student" and,
- modifications as "substantial changes from the grade level curriculum in what a student is expected to learn and or demonstrate."

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This module does not attempt to tackle the debate of what falls into the definition of adaptations, modifications, or assistive technology (AMAT), nor attempt to distinguish between each. Rather it addresses the need to implement AT, adaptations, and/or modifications with students with moderate and severe disabilities to ensure that they are learning and demonstrating learning to highest possible level.

An appropriate system of adaptations, modifications and assistive technology (AMAT) results in independent student performance. Independent performance has a tendency to look simple, but the work involved in facilitating that independence remains challenging to educators. Schwanke, Smith and Edyburn , 2001, describe a model, *A3 Model and Transition of Approach*, which looks at the process of creating universal accessibility to facilities, programs, and information. The authors examine Advocacy, Accommodation, and Accessibility as phases related to accessibility (universal design) for individuals with disabilities. This model directly reflects the attempts of educators to make the curriculum fully accessible to students with low incidence disabilities (severe cognitive disabilities, multiple disabilities).

The first phase is one of Advocacy. Advocacy focuses on the needs of individuals with disabilities, highlighting a need for systems change.   An example of advocacy within the current education arena is the No Child Left Behind Act (NCLB) which holds schools accountable for improving the performance of all students in relation to general education curriculum content and achievement standards (NCLB 2002).   Advocacy draws attention to the inequities within the current system of education in which students with disabilities have often been taught a separate curriculum, and not had full access to what has been determined by experts as what all students need to know and be able to do – the general curriculum. Figure 1 illustrates the A3 Model in which Advocacy clearly dominates the first phase in terms of effort towards transition to full accessibility, with little effort coming from accommodations and accessibility.
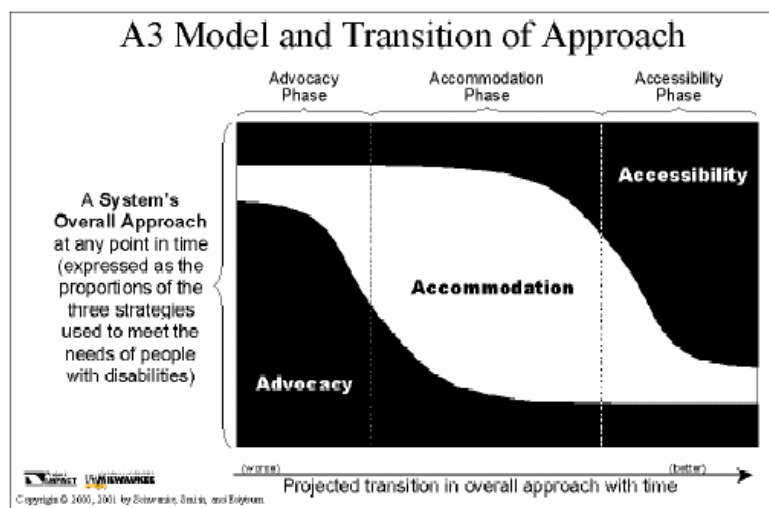

Figure 1

Figure 1
A3 Model Diagram Developed As Accessibility And Universal Design Instructional Tool. Schwanke, T., Smith, R. O., & Edyburn, D. L. (2001), June 22-26, 2001). *RESNA 2001 Annual Conference Proceedings*, 21, RESNA Press, 205-207.

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The second phase is one of Accommodation. Accommodation can take many forms. For example, a building that requires climbing stairs to enter the facility is not accessible to those using a wheelchair. Constructing a ramp would allow those using a wheelchair to enter the building. This qualifies as an accommodation. Accommodation is the typical response to advocacy when inaccessible environments and materials are modified to allow access. With the current focus on access to the general curriculum for all students, educational environments and materials need to be modified to allow all learners, regardless of ability, to work within the same curriculum. The phase of Accommodation advances as the AMAT system works to see that the individual needs of the student are met. It is clearly evident that during this phase the effort lies in remediating the inequities of the current educational system; effort applied to advocacy is reduced, and investigation into accessibility increases.

The third phase is one of Accessibility. Accessibility is described as an environment that is fully accessible to all students at the same time. In educational terms this would reflect Universal Design for Learning (UDL), described by CAST in which "a curriculum should include alternatives to make it accessible and appropriate for individuals with different backgrounds, learning styles, abilities, and disabilities in widely varied learning contexts (CAST, 2002)."   The principles of UDL, based on functions of the brain, are the keys to effective instructional unit design:

1. To support recognition learning, provide multiple, flexible methods of presentation.
2. To support strategic learning, provide multiple, flexible methods of expression and apprenticeship.
3. To support affective learning, provide multiple, flexible options for engagement.

When the principles of Universal Design for Learning are embedded into the design of an instructional unit, a greater percentage of students can access materials and participate meaningfully in class activities and the need for adaptations and modifications is reduced.

The typical curriculum has a fixed medium of presentation – paper. It represents a significant barrier to many students.
- Flexibility in curriculum materials and delivery facilitates student engagement.
- Curricular material presented in digital format can be manipulated to meet individual student needs.

UDL

For additional information and resources visit the CAST website (www.cast.org) such as:
- Software descriptions
- On line math resources
- Examples of UDL
- UDL Toolkits – Planning for all learners

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Defining learning for students with low incidence disabilities is a challenge and educators tend to become locked in the phase of Accommodation. Within this phase student learning is defined in terms of the general curriculum and ways to make made the curriculum accessible. The Accessing General Curriculum Module expands upon four steps included in a process described by Kearns, Burdge, and Kleinert (Innovations, in press). This process becomes a useful tool as individual learning is defined within a standards based environment. The Four Step Process outlines the procedure that teachers use to connect daily instruction to the standards. The first three steps are used by all teachers, and the fourth step assists educators in making the important link between IEP goals and daily instruction based upon and focused toward achievement of the standards.

With the learner outcomes for all students defined, the focus shifts towards making that learning accessible to students with low incidence disabilities. The SETT Framework developed by Joy Zabala provides an efficient means to develop a system of support for students with disabilities as they access the general education curriculum. It is designed to address the following elements – Student, Environment, Tasks, and Tools:

- **Student (S)** and his/her individual abilities, mode of learning, mode of communicating, needs, etc. should be considered. While these considerations are closely studied in the IEP process, it is important to continue to review this in the context of ongoing instruction.

- **Environment (E)** changes somewhat throughout the school year with ongoing instruction and instructional activities. The environment includes such things as physical arrangement of the instructional area, supports available to staff and student, materials and equipment utilized, and access issues. It also includes "expectations of others." This is a critical factor because if an expectation is not set, then the likelihood of achievement is slim.

- **Tasks (T)** are the instructional/learning activities in which the student is to participate in order to achieve learning standards within the curriculum. The tasks must be considered along with the student and environment before determining the tool. Doing otherwise would risk selecting a tool, although wonderful and possibly expensive, that is not of value to the student.

- **Tools(s)** are the adaptations, modifications, and assistive technology used to increase learning for the student. Additionally, strategies to increase independent use of the tool may need to be considered within the context of the environment and instructional activities. Tools should be something that the student, provided with time and instruction, can ultimately use independently. Furthermore the subsequent use within instruction should increase access to learning.

By focusing on the abilities and needs of the student while actively participating in an instructional learning activity associated with the general curriculum, barriers to learning can be identified and a system (AMAT) developed to overcome those barriers. Figure 2, an adaptation of the A3 Model and Transition of Approach, clearly shows that effort is concentrated in the area of accommodation as opposed to effort applied to advocacy or accessibility. The adaptation illustrates where the Four Step Process and the SETT Framework can be used within this phase

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to determine a system of AMAT. This accommodation phase moves instruction forward towards the promise of accessibility and Universal Design for Learning.
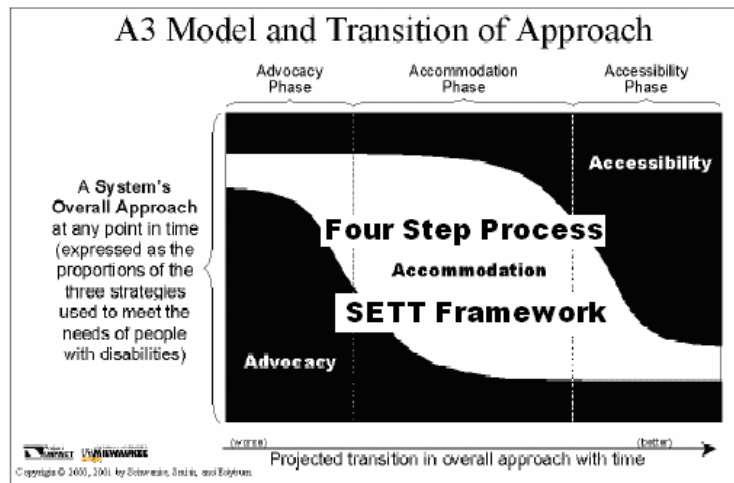

Figure 2

Figure 2
Adaptation of the A3 Model and Transition of Approach to show the alignment of the Four Step Process and the SETT Framework within the phase of Accommodation. (A3 Model Diagram Developed As Accessibility And Universal Design Instructional Tool. Schwanke, T., Smith, R. O., & Edyburn, D. L. (2001), June 22-26, 2001). *RESNA 2001 Annual Conference Proceedings*, 21, RESNA Press, 205-207.)

The Accommodation phase of the A3 Model assimilates the Four Step Process and the SETT Framework which forms the support system of adaptations, modifications, and assistive technology to transform curriculum into learning. This brings us to the purpose of the Assistive Technology module.

Guided Practice   Fill in the blanks:

1. AMAT is an acronym for _____ _____ _____ _____

2. _____ draws attention to the inequities within the current system of education in which students with disabilities have often been taught a separate curriculum and not had full access to what has been determined by experts as what all students need to know and be able to do - the general curriculum.

3. _____ is the typical response to advocacy when inaccessible environments and materials are modified to allow access.

4. The principles of UDL support multiple, flexible methods/options of _____, _____&_____, _____

5. SETT is an acronym for _____ _____ _____ _____
    Answers are located in Appendix D

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Purpose

While the comprehensive educational purpose of assistive technology is to help a student in all areas of school life, including such activities as moving about the school building, personal self care, and independence, this module will focus on the use of adaptations, modifications and/or assistive technology to access the grade level general curriculum. It is also closely aligned with the requirements of the Iowa Alternate Assessment. A review of this module should result in the appropriate development of AMAT that leads to further independence for the student in completing a learning activity.

Assistive Technology Continuum

Many know of individuals who have purchased some type of technology to help with a task, only to find the technology too cumbersome or complicated to be of much help. Later it was found that a simple, inexpensive trinket that already owned served the purpose quite adequately. There is a range of assistive technology devices from *no tech* to *high tech* that could be used for every task. However, it is not always the sleekest, most sophisticated technology that will best meet an individual's needs. Understanding the range of technologies available is the first step in identifying the devices that will help the individual in a variety of environments.

The least sophisticated of all assistive technologies are the *no tech* devices. This is often the most confusing category because how can something that is *no tech* be called an assistive technology. Devices in this category are most often typical objects used in atypical ways to achieve a task not intended by the designer of the device. For example, Velcro, usually used as a fastener, is placed on matching pictures for the student to use in a folder game. Using simple things like that all of the time without thinking about it is common. When its use helps a person with a disability achieve a goal not previously possible, it is an assistive technology device for that individual.

Low tech devices typically have no electrical or mechanical components. They are often specially designed devices with a single purpose. Examples include specially designed corner chairs and pencil grips. Always begin a search with no tech/low tech.

Medium tech devices are less sophisticated than *high tech* devices but are probably electronics-based with mechanical components. One example of a *medium tech* device is the BIGmack communicator (AbelNet) which allows a single message to be recorded for the user to activate. A student can use it to listen to facts taught in science or to share an answer.

High tech devices incorporate one or more sophisticated technologies, such as computer chips. One example of *high tech* device is the *Kurzweil 3000* system. It uses a computer system, a scanner, and software that translates print to electronic text, then uses text-to-speech technologies to read the electronic text out loud to someone who needs assistance with reading printed text. Various highlighting and note-taking capabilities are packaged within the system.
Keep in mind that as technology becomes more sophisticated what may have once been an assistive technology device is now commonly used equipment. For example the remote for a TV was once used primarily for people who were unable to manually change the TV channel. Now it is almost impossible to operate the TV without a remote. What is currently considered highly sophisticated technology, such as the guidance technologies on the space shuttle may, at

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sometime, become found in most homes. Therefore, it is important to be aware of growing technology and not limit student learning and demonstration of learning to what is currently in place. Regardless of low tech to high tech issues, it is important to appropriately select, develop, and implement AT that will allow the student to be more independent in the learning process, but remain challenged by expectations. Too often programs move directly to lower complexity, off grade level, or completely different work rather then providing even very basic adaptations or assistive technology.

Quality Indicators for Assistive Technology developed by the QIAT Consortium (July 2003)

A nationwide consortium has been organized by a group of leading experts in the field of assistive technology, with the goal of providing input into the ongoing process of identifying, disseminating, and implementing a set of widely-applicable Quality Indicators for Assistive Technology Services in School Settings that can be used as a tool to support the following:

1. school districts as they strive to develop and provide quality assistive technology services aligned to federal, state and local mandates;
2. assistive technology service providers as they evaluate and constantly improve their services;
3. consumers of assistive technology services as they seek adequate assistive technology services which meet their needs;
4. universities and professional developers as they conduct research and deliver programs that promote the development of the competencies needed to provide quality assistive technology services; and
5. policy makers as they attempt to develop judicious and equitable policies related to assistive technology services. (www.qiat.org)

Following is a brief description of each area of the Quality Indicators for Assistive Technology (QIAT). The detailed descriptors with additional information on each are located in Appendix A.
.

- **Administrative support**: This area defines the critical areas of administrative support and leadership for developing and delivering assistive technology services. It involves the development of policies, procedures, and other supports necessary to sustain effective assistive technology programs.

- **Consideration of needs**: Consideration of the need for assistive technology devices and services is an integral part of the educational process identified by The Individuals with Disabilities Act of 1997 (IDEA 97) for referral, evaluation, and Individual Education Plan (IEP) development. Although assistive technology is considered at all stages of the process, the Consideration Quality Indicators are specific to the consideration of assistive technology in the development of the IEP as mandated by IDEA 97. In most instances, the Quality Indicators are also appropriate for the consideration of assistive technology for students who qualify for services under other legislation (e.g., 504, ADA).

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- **Assessment of needs**: Quality Indicators for Assessment of Assistive Technology Needs is a process conducted by a team used to identify tools and strategies to address a student's specific need(s). The issues that lead to an assistive technology assessment may be very simple and quickly answered or more complex and challenging. Assessment takes place when these issues are beyond the scope of the problem solving that occurs as a part of normal service delivery.

- **Documentation in the IEP**: IDEA 97 requires that the IEP team consider assistive technology needs in the development of every IEP. Once the IEP team has reviewed assessment results and determined that assistive technology is needed for provision of Free and Appropriate Public Education (FAPE), it is important that the IEP document reflects the team's determination in as clear a fashion as possible. The Quality Indicators for Assistive Technology in the IEP help the team to describe the role of assistive technology in the child's education program.

- **Implementation**: Assistive technology implementation pertains to the ways that assistive technology devices and services, as included in the IEP (including goals/objectives, related services, supplementary aids and services and accommodations or modifications) are delivered and integrated into the student's educational program. Assistive technology implementation involves people working together to support the student using assistive technology to accomplish tasks necessary for active participation in customary educational environments.

- **Evaluation of effectiveness**: This area addresses the evaluation of the effectiveness of the assistive technology devices and services provided. It includes data collection and documentation to monitor changes in student performance resulting from the implementation of the assistive technology device. Student performance is reviewed in order to identify if, when, or where modifications and revisions to the implementation are needed.

> **Activity**

Select one of the QIAT Self Evaluation Sections and complete.

Implementation

When looking at the process of accessing the general curriculum one will find that the use of AT will be crucial to the process. The Four Step process is important to keep in mind when implementing assistive technology as noted in Table 1.

It is important to follow the IDEA 97 process for consideration, evaluation, and documentation of assistive technology on the IEP. Iowa's Assistive Technology Manual: Creating a Pathway provides detailed guidance for Assistive Technology and the IEP. Refer to that document for information on consideration, evaluation, and documentation. This document has additional information and resources and is recommended reading.

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Table 1 Threading the Implementation of AT through the Four Step Process

Four Step Process	Implementation of AT
Link to the appropriate standard	• The use of AT should assist the student in progressing within the general curriculum which is based on local and district standards. • Todis and Walker (1993) found that often staff perceived the goal being the use of the assistive technology rather than the student use of assistive technology to perform specific tasks or meet IEP goals.
Define the learning outcomes for all students	• The use of AT should assist the student in learning the curriculum to the highest possible level. • It is not up to the teacher to question the importance of the learning but to decide how to maximize the learning experience

Identify learning activities	• The use of AT should assist the student in actively participating in instructional activities that result in increased learning towards the desired outcome for all students.
	  – Participation should be active vs. passive
	  – Active participation should lead to the same learning outcome as all students vs. an alternate outcome
	• The use of AT should assist the student in being more independent in participating in the instructional activity
	  – Independence should not preclude increased learning opportunities

Target specific objectives from the IEP	AT should be included in the IEP to support • achievement of IEP goals and objectives and, • participation & progress in the general curriculum • In some cases the IEP objective may be the use of an AT device to increase learning.

The process of developing a successful system of support that facilitates student access to the general curriculum is a complex one. The support system must be developed on an individual basis involving input from all those involved with the student's learning. This team must be a flexible, multidisciplinary team including members of the IEP team, the student, family members or caregivers, educational and related service providers, as well as healthcare providers, assistive technology specialist or other specialists linked to student need, and even peers. Open channels of communication and shared knowledge are crucial elements to the success of this team. With this team in place, decisions can be reached which will outline a path of access to grade level general curriculum materials and progress within that curriculum. Teachers responsible for implementing this access path carry significant responsibility. The teacher must garner the expertise of the multidisciplinary team to guide them to appropriate tools that will aid the student with access to the general grade level curriculum.   A skilled teacher utilizing an appropriate

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system of AMAT gives the student seamless access to the grade level general curriculum alongside typical peers.

> *One can make an analogy to a musical performance. The multidisciplinary team may provide the notes to be played, but the expertise of the teacher arranges those notes and allows the student to create great music.*

The following decision matrix leads the IEP team to bring out the elements that will assist in this music making process! The SETT Framework (Zabala, 2002) allows the team to gather appropriate information regarding the student's performance and current supports, while acknowledging environmental influence. With the focus on the instructional learning activity (which Zabala refers to as the Task), this information is examined in terms of what the student is unable to do without assistance. It is this information that provides the basis for a planning session targeted at developing a system of AMAT that supports the student in the learning process.

Guided Practice

Use the following student description and practice filling in the matrix as it is reviewed.

Jean is 12, and just entering middle school. She is a delightful young lady but due to the severity of her disability she has remained in a separate class throughout her school career, though has attended music and art. Jean has cerebral palsy and is a dependent wheelchair user. Due to curvature of the spine correct positioning is essential. She has limited range of motion in her upper extremities, and a poor grasp and release mechanism; she is left dominant. Jean has a tendency to turn her head to the right and requires consistent cueing to return her head position to midline; she tires easily. Jean's vision is limited but her hearing appears adequate since she responds to voices in the room and environmental sounds. All those familiar with Jean report that she knows far more about her surroundings than she is given credit for. Jean has a fairly consistent yes/no response, which is a single sound for yes and 2, sounds for no. Using her left hand, Jean utilizes a pre-programmed single communication aid to participate in activities. Jean's family would like her to improve her communication skills, and increase her circle of support. Jean is motivated by contact with her peers – she changes facial expression when she is spoken to.

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THE MATRIX

I. STUDENT

The first component of the decision matrix addresses the student's current level of function, which is the first component of the SETT Framework (Zabala, 2002), the Student. This includes information on communication, learning style, computer access, mobility, and any health or medical issues. While these considerations are closely studied in the IEP process, it is important to review these within the context of ongoing instruction. The information gathered will be utilized to develop a system of support.

First, the student's communication system is addressed (section 1a of the matrix).
A consistent system of communication is essential to successful learning. Identifying the student's means of communication emphasizes how information should be presented to the student, an important but sometimes overlooked factor in accessibility. A checkmark should be placed beside the primary means of communication for the student, indicating both expressive and receptive means. The following categories are listed in Table 2:

Table 2 Student Means of Communication

- Objects - Object Symbols - Tactile Cues - Braille - PECS - Pictures/Graphics/Symbols - Communication Board (pictures/objects/letters/word) - Eye-gaze board	- Sign Language - Simple voice output device - Voice output device with levels - Voice output with icon sequence - Voice output with dynamic display - Verbal - Consistent Yes/No response - None - Other, please describe:

If the student does not have a consistent communication system in place, the IEP team should consider an evaluation by a Speech Language Pathologist, with expertise in the area of augmentative and alternative communication (AAC), or consult the AEA AT team.

To continue collecting information about the learner, the student's primary means of access to the general curriculum is addressed (section 1b of the matrix).

Five categories of learning are examined – kinesthetic, tactile, visual, auditory, and multimodal. The students learning style will be identified in this section (Table 3).

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Table 3   Student Learning Style

Learning Style	Kinesthetic Learner	Tactile Learner	Visual Learner	Auditory Learner	Multimodal
Characteristics	Individual works best when able to move and do things with large muscles.	Individual works best when able to feel using small motor muscles.	Individual works best when able to see, watch, read, and review.	Individual works best when able to hear, speak, discuss and think aloud.	Individual works best when utilizing a variety of methods to learn.
Method	• Participation in activities through large muscle movement (walking, lifting, moving) • Hands-on activities • Field trips • Using a model • Manipulatives • Sequence of steps	• Objects / manipulatives related to content • Object symbols • Tactile Cues • Tactile materials • Tactile computer access	• Picture Exchange Communication System (PECS) • Visual representation for receptive learning • Visual representation for expressive learning • Text supported with graphics • Graphic organizer	• Emphasis on auditory learning • Materials presented on audio tape • Digital text with auditory output • Talking calculator • Voice recognition software	• Movement • Objects • Manipulatives • Graphics • Auditory

Again this information is vital in addressing the student's needs when developing a system of AMAT. To complete this section identify the student's means to access the computer, mobility, and health or medical issues that influence learning.

ENVIRONMENT, TASK (INSTRUCTIONAL ACTIVITY) AND TOOLS

The second component of the matrix (sections II, III, IV) addresses the remaining elements of the SETT framework (**E**nvironment, **T**ask/Instructional Activities, and **T**ools) and how this framework compliments the Four Step Process (Link to the appropriate Standard, Define Learning Outcomes, Define Learning Activities, and Link to the IEP).

II. ENVIRONMENT

The first element (section II) examines the Environment. Within the Environment, Zabala focuses attention on factors that influence learning:
- physical and instructional arrangement;
- support for both staff and student;
- materials and equipment that are available to all;
- access issues to include physical, technological and instructional; and
- expectations of others.

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The environment may change somewhat throughout the school year with ongoing instruction and instructional activities but the elements that affect learning remain constant.

Environment and the Four Step Process:

1. Identify the local *standard and benchmark* that the student will be working towards, from one that all students are addressing. Record the standard/benchmark, and where this learning will occur.

2. Identify the *learning outcomes* within the grade level curriculum, and record the environmental factors that may affect learning, e.g. what instructional procedures will be utilized in the delivery of instruction and what expectations there are for student learning.

   Expectation of learning is a critical factor to consider and is often overlooked. If there is no expectation of learning, the teacher is not likely to spend time in preparation of materials or instruction. Without these elements, this becomes a self-fulfilling prophecy – no expectations, no teaching, no learning. Beukelman and Mirenda (1992) discuss AAC in terms of Access Barriers and Opportunity Barriers. Access Barriers are defined as physical access to materials, or equipment that is not working. Opportunity Barriers are described as discriminatory in nature, imposed in part by negative attitudes. This philosophy can also be applied to student learning. If a teacher has no expectation of learning for the student, then an opportunity barrier is generated; it is a missed opportunity for student learning. The likelihood of achievement is slim to none.

No expectation ⟹ No teaching ⟹ No learning
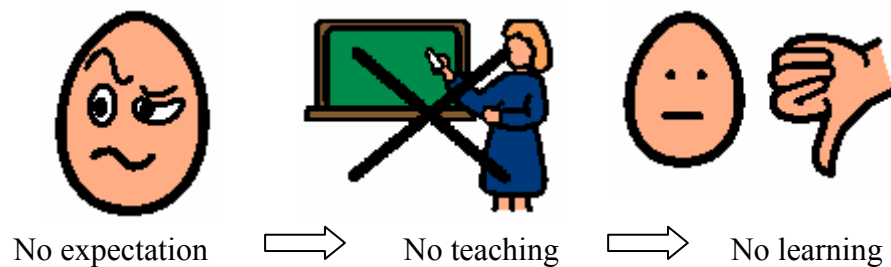
3. Identify the *learning activities* for the student and what environmental influences impact learning. Examine the support available to both the teacher and the student. This may include materials and equipment (e.g. computer, alternate keyboard, materials needed for the individual student, and whether assistance is available in terms of peers or paraprofessional support). As learning activities are designed, the physical arrangement of the environment must be taken into consideration, and again the crucial element of attitudes and expectations as discussed earlier come into play.

4. Focus on the *IEP*. Examine supports specified in the IEP, and specially designed instruction, and how these are implemented. Are these in place for the student in all environments that are encountered in accessing the general curriculum? What progress data is being kept?

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III. TASK

This is the third stage of Zabala's SETT Framework. This stage addresses instructional activities that the student will complete, identifies areas of concern that may impact access to the general education curriculum, how those concerns are currently being addressed, and examines barriers that may still interfere with learning for that student.

The first section of the matrix (section IIIa) addresses areas of concern that may impact learning. This may include the following:
- Vision
- Hearing
- Seating and Positioning
- Mobility
- Receptive Communication
- Expressive Communication
- Listening Comprehension
- Mechanics of Writing
- Learning and Studying
- Computer Access
- Social Competence
- Activities of Daily Living

This information will be utilized as the team develops a system of AMAT after gathering the required data. As the matrix is completed, areas of concern should be checked.

TASK and the Four Step Process – Opportunities for Learning (IIIb)

1. Continuing to look at the area of Tasks, or instructional activities, Zabala focuses on what opportunities might be present to move the student towards mastery (section IIIb). The opportunity to move toward mastery within the Four Step Process is focused on the standards (Core Content Standards and Benchmarks Related to the Iowa Tests). Look at the *Standard* and the Task together; examine how the student might access this standard, and what learning might look like for this student.

2. Look at opportunities to move the student toward mastery of the *learning outcomes* targeted for the student. Examine how the student will demonstrate learning.

3. Identify opportunities for learning within *instructional activities* for the student based on the grade level general curriculum. These activities should require active involvement from the student that moves the student toward learning.

4. Linking to the *IEP* focuses on the IEP goals that can be addressed within the general curriculum.

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TASK and the Four Step Process – Strategies and accommodations already in place (IIIc)

Following the SETT Framework, Zabala focuses on special strategies, accommodations, adaptations, modifications and tools that are currently being used to remove barriers for this student.

1. Examine the *learning standard* that has been identified for this student. Are there elements of UDL that have been applied to general class instruction so that the student may access this learning standard? Does the teacher present material in multiple ways and have flexible options for assigned work? How are the students engaged in learning? Are different ways of engagement accepted and valued in this classroom?

2. Identify what strategies are being used in the classroom that assist this student in learning, e.g. does the student require materials ahead of time to access to the *learning outcomes?* What system of AMAT is already in place for this student? Does the student have modified work, or perhaps use visuals, or even objects to tie into the grade level content material? In this section, record details of those strategies.

3. Examine the *learning activities* and what support is used in *actively* participating in these activities. Does the student use modified text, text with symbols perhaps? Does the student use an adaptive keyboard or require objects? What does learning look like for this student?

4. Examine the *IEP* and the supports that are stipulated by the IEP. Are the supports listed in the IEP available in all environments where the student accesses the grade level general curriculum? What supports listed on the IEP result in the independent use of AMAT?

TASK and the Four Step Process – Continuing Barriers (IIId)

In this phase Zabala directs us to scrutinize what barriers remain as the student accesses the general curriculum. This step is crucial to independent performance and learning.

1. Does this student have full access to the *learning standard*? Does the student have the same opportunities as typical, same age peers? Has learning been demonstrated? If the responses to these questions are negative, then look for barriers that may still exist for that student. Barriers may exist in terms of the following (these are examples and not an exhaustive list):
   - Physical Location
   - Materials
   - Learning Standard not defined

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- Limited expectations for learning
- Limited content expertise
- Pull out therapies reducing time spent learning content

2. When looking at the *learning outcomes* for the student, are there still barriers that prevent the student from fully accessing these and demonstrating success in learning? Barriers may exist in terms of the following (these are examples and not an exhaustive list):
    - Limited expectations for learning
    - Inflexible instructional procedures
    - Limited means to respond to learning
    - Inadequate modifications
    - Physical limitations
    - Inability to comprehend content material in terms of the delivery method or materials provided
    - Inability to communicate regarding the content material
    - AAC device not programmed with content vocabulary

3. Look for *barriers* that may remain as the student accesses the *learning activities*. Are the supports being utilized in terms of AMAT allowing independent performance of learning activities? Barriers may exist in terms of the following (these are examples and not an exhaustive list):
    - Limited expectations for learning
    - Unable to follow verbal directions – directions presented in a manner not consistent with student learning style
    - Unable to read directions to activities – directions not provided in student method of communication
    - Unable to complete activity in specified time – insufficient time allowed for activity
    - Unable to hold materials – no modifications made to allow student with physical limitations to manipulate materials
    - Unable to access the computer – no provision of alternate keyboard or switch accessible software
    - Unable to write legibly or at all – no alternate provision made for a means to write
    - Unable to respond to grade level text – text not modified or put into a form that the student can comprehend
    - Unable to communicate to teacher or peers – no consistent means of communication established; AAC device not available in all settings; no compatible vocabulary
    - Unable to respond to questions addressed to the class – questions not provided in students communication style, or means to respond not provided
    - Unable to actively participate in class activities – read, write, count, etc.
    - The device is not operational; no one knows how to operate it or repair it

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4. Focus on the *IEP* and determine the degree of success that the identified supports have had in supporting student learning within the general curriculum. If the student is not able to participate with independent use of the adaptation, modification or assistive technology, then barriers still exist. These barriers should be noted so that they can be examined in terms of what system of tools will guide the learner to greater independence in learning.

IV. TOOLS

The Tools referred to in the SETT Framework (Zabala, 2002) encompass a system of support that includes instructional strategies, adaptations, modifications, and assistive technology. Tools form a system to be fashioned according to individual need. Each system will vary since individuals vary in ability and need. Two students may use the same tool, but utilize that tool in different ways. It is the combination of the individual needs of the student, the environment and the task that dictates the system of tools. For purposes of Iowa's Alternate Assessment, documentation should indicate independent use of adaptations, modifications, and assistive technology.

Although the SETT Framework offers a thorough system to gather information needed to make decisions about tools, it is not the only means. The process for determining need is dependent on a variety of factors, including the individual's current use of assistive technology and other evaluation information. An assistive technology evaluation completed by a multidisciplinary team is a common means to gather information, and may be an essential part of the decision making process when members of the IEP team do not have the background or experience to make effective decisions about assistive technology. An individual with complex needs may require a specialist with a background in assistive technology to determine the features necessary for an effective tool, such as switch access site, target size, range, and sensory requirements. Input from a variety of service providers, for example occupational therapist, or speech pathologist. would be essential to this process. At this point it would be necessary to contact the AEA to determine if an assistive technology evaluation is appropriate, as outlined in the Iowa Assistive Technology Manual, *Creating a Pathway* (1998). Following best practice assessment should:

- include a review of strategies and tools already tried;
- be recognized as an on-going process;
- be based on data;
- be multidisciplinary;
- include the student;
- include the family;
- include observation in the natural environment;
- include assessment in the natural environment;
- include discussions with individuals significantly involved with the student;
- include a trial period of the device in the natural environment held within reasonable time limits;

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- assign roles of responsibility to team members;
- include a plan for device maintenance and repair; and
- include a plan to collect data on the effectiveness of the tool.

The success of the brainstorming session to identify "tools" (Zabala, 2002) directly reflects the quality of information gathered in the first three stages of the SETT Framework. When considering this information investigate what no tech, low tech, and high tech options should be contemplated when developing a system of support for an individual student. This system may encompass different tools reflecting differing environments and learning activities. To support this brainstorming process, use the *Pathways to Learning* document Abeldata, and other print or electronic resources. (appendix C & D)

Figure 3 Pathways to Learning for Students with Cognitive Challenges (Denham 2003)

Figure 4 Abledata (http://www.abledata.com)

Brainstorming should focus on the barriers identified in Column IIId in relation to the tasks/activities to be completed, and how individual student needs match features of different tools to provide the correct type and level of support. A close feature match will result in independent use of AMAT.   The following questions guide the teacher to utilize information already gathered.

Guiding Questions:

Does the tool have features that:
- match the student's primary method of communication;
- match the student's primary learning style;
- allow access to the computer e.g. physical access;

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- allow for mobility and transition;
- do not compromise health and medical concerns;
- are compatible with the selected environment;
- facilitate learning opportunities / match the task;
- allow student to demonstrate learning;
- build on a successful system already in place;
- overcome identified barriers to learning; and
- are accepted by the student and family members?

Device selection could be narrowed down by these additional considerations:

- Identify advantages and disadvantages
- Durability and resiliency
- Available for trial
- Funding
- Training
- Technical support and maintenance
- Compatibility with current equipment in the environment

For additional considerations, see the Iowa Assistive Technology Manual, page 73, section VII, item 10.

An appropriate system of support facilitates access to the general curriculum and moves individuals towards independence. By aligning the SETT Framework within the Four Step Process, educators can design an appropriate system of Adaptations, Modifications, and/or Assistive Technology leading to further independence of student performance.

By completing the AMAT process, the team will have done the following:

- Identified the environment
- Specified the task and broken it down
- Clarified the barrier
- Utilized the student's learning style and current abilities
- Identified features that are required for access
- Brainstormed options and checked all resources
- Set up trials
- Established roles
- Collected data

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Matrix to Determine Adaptations, Modifications, and Assistive Technology (AMAT) to Access the General Curriculum
Alignment of the Four Step Process (IHDI) with the SETT Framework (Zabala)

Student: **Date of Birth:**   **Grade level:**   **Current Date:**

Follow the instructions below to complete the student profile (guided by the SETT Framework, Joy Zabala) and determine appropriate adaptations, modifications, and assistive technology (AMAT) to support access to the general curriculum. From this point the acronym AMAT will be used for adaptations, modifications and assistive technology.

Student's Current Level

I. STUDENT Identify the student's current abilities:
- student's primary method of communication,
- primary means of accessing the general curriculum.

II. ENVIRONMENT Identify the Standard the student will be working on which should be selected from the Standards that all students are addressing.
   Consider each of the following in relationship to the standard and learning environment:
- Arrangement (physical, instructional)
- Support (for both student and staff)
- Materials and equipment available to all students
- Access issues (physical, technological, instructional)
- Expectations of others

III. TASK
- III a - Note the areas of concern that impact access general curriculum.
- III b - List the tasks that the student will access while working on the identified standard – learning outcomes, activities and IEP goals.
- III c - List any special strategies, accommodations, AMAT, tools that are currently being used to remove barriers for this student during the learning process.
- III d - Identify continuing barriers that interfere with the learning process or hinder the level of independence for the student.

IV.   TOOLS Identify possible solutions to identified barriers
- AMAT
  - Adaptations
  - Modifications
  - Assistive Technology.
- *Pathways to Learning* document is a good resource,
- Other resources:
  - Abeldata,
  - AEA team
- Focus should be on:
  - Barriers in relationship to the learning outcomes and instructional activities
  - Individual student needs and matching features of different tools to determine the correct type and level of support
       A close feature match will result in independent use of AMAT.

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I. STUDENT: Current abilities

a) Identify the student's primary method of communication. Use an "R" to indicate Receptive and "E" to represent Expressive:

· Objects	· Eye gaze board	· Consistent Yes/No response
· Object symbols	· Sign Language	· Other – describe:
· Tactile cues	· Simple voice output device	· If no standard means of communication use available resources (e.g., speech path, A.T. evaluator, AEA)
· Braille	· Voice output device with levels	
· PECS (Picture Exchange Communication System)	· Voice output with icon sequence	
· Pictures/Graphics/Symbols	· Voice output with dynamic display	
· Communication Board	· Verbal	

Identify the student's primary means of access to the general curriculum (select from more than one section if student is a multimodal learner)

Kinesthetic Learner: Participation in activities through large muscle movement (walking, lifting, moving); Hands-on activities; field trips; Using a model; Larger objects/manipulatives related to content; Use a sequence of steps; Other (Please describe)

Tactile learner: Objects/manipulatives related to content; Object symbols (actual items or parts of items); Tactile Cues (items, parts of items, or representative items mounted on categorized materials); Tactile materials (to provide sensory and kinesthetic feedback); Tactile computer access (textured overlays with alternate keyboard / tactile switch access); Other (Please describe)

Visual learner :   Picture Exchange Communication System (PECS); Visual representation for receptive learning / communication (photos, symbols) ; Visual representation for expressive learning /communication (photos, symbols); Text supported with graphics (photos, symbols, charts) for receptive and expressive learning / communication; Graphic organizer; Other (Please describe)

Auditory learner :   Emphasis on auditory learning; Materials presented using audio tape; Digital text with auditory output; Talking calculator; Voice recognition software; Other (Please describe)

Alternative computer access :   Alternate keyboard; Touch screen; Custom overlays; Switch access; Scanning; Joystick / trackball; Text-to-speech software; Other (Please describe)

Mobility: Dependent Wheel Chair (WC) user; Independent WC user with assist; Independent WC user; Ambulatory with assist; Ambulatory with walker; Ambulatory; Other (Please describe)

Health / Medical issues: Please describe medical cautions, health issues, etc.:

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Student Information Chart
a) **STUDENT: Current abilities**
b) **Identify the student's primary method of communication, both receptive and expressive:**
c) **Identify and briefly describe the student's primary means of access to the general curriculum:**
d) **Learner using multimodalities:**

Alternative computer access :	
Mobility:	
Health / Medical issues:	

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Questions to answer on chart	**II. ENVIRONMENT:** • Arrangement (physical, instructional) • Support (for both student and staff) • Materials/equipment available to all • Access issues (physical, technological, instructional) • Expectations of others	**III a TASK (INSTRUCTIONAL ACTIVITY):** • Identify areas of concern that may impact access to the general education curriculum ❑ Vision ❑ Receptive communication ❑ Listening comprehension ❑ Learning/studying ❑ Hearing ❑ Computer access ❑ Seat/Position ❑ Expressive communication ❑ Mechanics of Writing ❑ Social competence ❑ Mobility ❑ ADL What specific tasks or instructional activities are required for active involvement in accessing the identified standard and to demonstrate learning?			**IV. TOOLS:** • Highlight the student's learning style and means of access to the general curriculum. • Describe adaptations, modifications, or additional assistive technology to be tried that may facilitate independence.
	Identified Standard:	III b. What opportunities are present to move the student toward mastery?	III c. Describe special strategies, accommodations, adaptations, modifications and tools that are currently being used to remove barriers for this student.	III d. Are there continuing barriers that the student encounters when attempting this task? If so, describe.	Identify the characteristics of student need and match the need to features of tools that will result in independent use of AMAT.
Link to the Appropriate standard	Where will the student be working on the standard?	How will the student access this standard? What does learning look like for this student?	What elements of UDL have contributed to learning for this student?	What barriers limit full access to learning this standard for this student?	
Define the Learning Outcome within the general curriculum	Identify the instructional procedures that will be utilized in the delivery of instruction and expectations for the student	What learning outcomes will be targeted for this student? How will the student demonstrate learning?	What strategies and AMAT have resulted in learning for this student?	What instructional procedures hindering progress for this student? What perceived expectations limiting the student's progress?	
Define the Learning Activities.	What support is available to the teacher and student? Identify environmental conditions that will affect learning: physical arrangement, materials, attitudes and expectations.	What specific activities create opportunities for active involvement in learning the standards and learning outcomes?	What strategies and AMAT are in place that results in active participation for this student?	What barriers interfere with participating in learning activities that maximize potential and independence?	
Link to the IEP.	Look at the supports & specially designed instruction listed on the IEP. Are these in place?	What IEP goals can be addressed while accessing the general curriculum?	What supports stipulated by the IEP result in independent use of AMAT?	What supports are insufficient to allow progress on the IEP?	

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Chart	**II. ENVIRONMENT:** • Arrangement (physical, instructional) • Support (for both student and staff) • Materials/equipment available to all • Access issues (physical, technological, instructional) • Expectations of others	**III a TASK (INSTRUCTIONAL ACTIVITY):** • Identify areas of concern that may impact access to the general education curriculum			**IV. TOOLS:** • Highlight the student's learning style and means of access to the general curriculum. • Describe adaptations, modifications, or additional assistive technology to be tried that may facilitate independence.
		❑ Vision ❑ Hearing ❑ Seat/Position ❑ Mobility	❑ Receptive communication ❑ Expressive communication	❑ Listening comprehension ❑ Mechanics of Writing	❑ Learning/studying ❑ Computer access ❑ Social competence ❑ ADL
		What specific tasks or instructional activities are required for active involvement in accessing the identified standard and to demonstrate learning?			
	Identified Standard:	III b. What opportunities are present to move the student toward mastery?	III c. Describe special strategies, accommodations, adaptations, modifications and tools that are currently being used to remove barriers for this student.	III d. Are there continuing barriers that the student encounters when attempting this task? If so, describe.	Identify the characteristics of student need and match the need to features of tools that will result in independent use of AMAT.
Link to the Appropriate standard					
Define the Learning Outcome within the general curriculum					
Define the Learning Activities.					
Link to the IEP.					

AMAT SUMMARY: If the IEP team has determined that a need exists, describe what will be provided (more specific assessment of need for assistive technology; existing tools, adaptation or modification of existing tools; additional tools; technical assistance on device operation or use, or training of student, staff, or family).

AMAT Summary	List possible accommodations, modifications and assistive technology to access the general curriculum.	Indicate the need for further assistance; Contact AEA.
Adaptations / Modifications		
Assistive technology		
AAC		
Alternative computer access		

NOTES:

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Student vignettes:

Evelyn is a student with a moderate disability, requiring limited to extensive supports. She is verbal but difficult to understand due to articulation difficulties. She is able to write her name if not required to remain on the line and can copy printed text. She can identify approximately 50 high frequency sight words and short sentences when picture cues are provided. She counts to 39 consistently and to 100 with some mistakes. She can count by 5's if provided with number cues. She can take care of self-care skills but needs verbal reminders. Evelyn's IEP objectives include:

- Writing vocabulary words independently or using available resources (e.g. word cards)
- Increasing high frequency sight words
- Answering recall questions when material is read
- Identifying numbers to 100
- Using a calculator for computation
- Using measurement tools
- Improving articulation
- Using picture symbols to supplement verbalization as needed

Carlos is a student with a severe disability who requires pervasive supports. He uses a wheelchair which he can self propel for very short distances, uses an augmentative communication device with up to five choices and with verbal cues. He will identify common objects and is beginning to use picture symbols. He needs prompting to attend to an activity or task for longer than 3 minutes. Carlos frequently needs to rest following seizures which occur approximately six times per day. Carlos' IEP objectives include:

- Identifying picture symbols
- Self-propelling wheelchair for moderate distances
- Following verbal and/or pictorial directions involving 3 to 5 steps
- Matching shapes
- Using 1 to 1 correspondence
- Independently initiating communication using augmentative system
- Remaining on task for 5 minutes with natural cues
- Writing responses to two response item questions for inclusion in his portfolio

Lesson Plan
Using the following lesson plan, the process of completing an AMAT Matrix is illustrated.

Racing Speeds – Past and Present
Grade level 5 – 8
Summary: Students discuss current knowledge about auto racing, specifically Indy style racing. Using provided web resources the students will read about racing and then collect racing speeds and finishing times over the past years. The students will gather the data and graph the information using a clustered bar graph. Finally, the students will interpret the data and respond to several questions regarding the data.

Evelyn's AMAT

a) STUDENT: Current abilities
Identifies numbers 1 - 32 and counts to 59 with occasional mistakes. She can copy anything and writes 1 - 10 independently

b) Identify the student's primary method of communication, both receptive and expressive:
She is verbal with some articulation problems. She reads some words but does best when paired with picture symbols. She copies but can not write independent thoughts.

a) Identify and briefly describe the student's primary means of access to the general curriculum:
She is an auditory learner but sometimes needs a visual representation.   For example, she counts better when the numbers are written in order.

b) Learner using multimodalities:

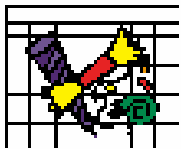|	
Alternative computer access :	She can type short words on the computer with a printed model. She can click and drag the mouse. She doesn't always understand the process.
Mobility:	Walks with no limitations
Health/Medical issues:	None

	II. ENVIRONMENT	III a TASK (INSTRUCTIONAL ACTIVITY) – Identify areas of concern that may impact access to the general education			IV. TOOLS
	Identified Standard: Interpret data from a variety of sources	III b. What opportunities are present to move the student toward mastery?	III c. What special strategies, accommodations, adaptations, modifications and tools that are currently being used to remove barriers for this student?	III d. Are there continuing barriers that the student encounters when attempting this task? If so, describe.	Identify the characteristics of student need and match the need to features of tools that will result in independent use of AMAT.
Link to the Appropriate standard	She will work at a group table in math class and at a computer in either the classroom or the computer lab	She will work on the standard with fewer and simpler learning outcomes expected	The teacher is having the students work in groups and they can either hand complete their graphs or use the computer.	She is included in all of the instruction	She needs something that can go from room to room with her
Define the Learning Outcome within the	• Lecture • Discussion • Look up information • Enter data • graph	• talk about current knowledge and make predictions on how speed will change • locate and copy data • enter data in computer and graph • indicate if data goes up or down • answer questions by writing short sentences	• She does pick up on picture symbols quickly • She copies written material from other students • She picks up a lot on the discussions	• The class moves quickly and it is hard for her to keep up • When she copies she doesn't usually know what she is writing • Some people feel it isn't important for her	She needs something to help her participate in discussions, to help her find information on the computer, and a way to enter data and graph.

	II. ENVIRONMENT	III a TASK (INSTRUCTIONAL ACTIVITY) – Identify areas of concern that may impact access to the general education			IV. TOOLS
	Identified Standard: Interpret data from a variety of sources	III b. What opportunities are present to move the student toward mastery?	III c. What special strategies, accommodations, adaptations, modifications and tools that are currently being used to remove barriers for this student?	III d. Are there continuing barriers that the student encounters when attempting this task? If so, describe.	Identify the characteristics of student need and match the need to features of tools that will result in independent use of AMAT.
Define the Learning Activities.	She will have the general ed. Teacher and some help from a paraprofessional.\n\nPeers help a lot	• Class discussion\n• Group work\n• Exploring on the computer	• Some use of picture symbols\n• Providing a model\n• Including her in discussions	She does not have a way to write answers so she just gives them orally which cuts down on her independence	She needs to be as independent as possible on the "written" part of the activity
Link to the IEP.	She is working on articulation with the speech therapist , she has models for counting, and she uses picture symbols	• Number recognition\n• Using a calculator to add the numbers\n• articulation	She needs picture symbols and/or auditory feedback to provide her access to the material in the general curriculum	She is learning isolated words and can work with numbers in isolation, need to do more generalization	

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AMAT SUMMARY: If the IEP team has determined that a need exists, describe what will be provided (more specific assessment of need for assistive technology; existing tools, adaptation or modification of existing tools; additional tools; technical assistance on device operation or use, or training of student, staff, or family).
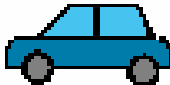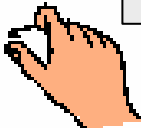
AMAT Summary	List possible accommodations, modifications and assistive technology to access the general curriculum.	Indicate the need for further assistance; Contact AEA.
Adaptations / Modifications	The speech therapist could work with her on her numbers and the racecar vocabulary to improve articulation while reinforcing the math vocabulary	
Assistive technology	The team looked at Writing With Symbols 2000 to add picture symbols into every area easily. It is low in cost and helps her read and type independently	See if there is a site license so that she can use it in several rooms
	The teachers will decide upon the critical vocabulary words to work with her on and will concentrate on the IEP skills as part of this activity.	
AAC		
Alternative computer access	The teacher can bookmark the correct web page or set it up as part of the class webpage so that she can easily go to the correct place The WWS 2000 will also provide her needed auditory feedback	

NOTES: **It was decided that copying would be used only with words (possibly in short sentences) that she could read and therefore ready to learn to write.**
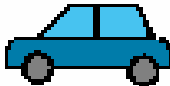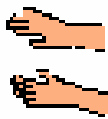
Evelyn's Work Sample

Evelyn   January   **20**

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graph   up

> Evelyn verbally gave her answer and then typed each one before being asked the next question. She used the A.T. 100% independently.

cars   went   faster

cars   got   little

⌒ A printout of the work that Evelyn typed into the computer using Writing With Symbols 2000 and after being asked basic questions about the information on the graph.

Carlos: Current Abilities

Fill this information in I. Student section of the AMAT Matrix

- Method of communication
  - Simple voice output communication device

- Primary means of access
  - Objects/manipulatives related to the content area
  - Picture symbols (expressive & receptive)

- Computer access:
  - None

- Mobility
  - Self propels wheelchair

- Health/medical
  - Frequent seizures
 - Sleeps periodically throughout the day
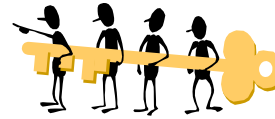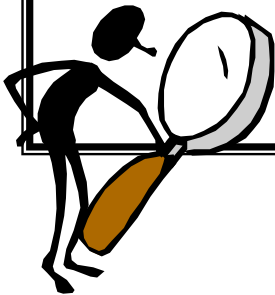
Key Points

- The student section will only need to filled in initially and then only following major changes
- Much of the information on Carlos was gathered during the evaluation and IEP process
- Use the student section of the AMAT Matrix as reference each time a new instructional unit is planned

Important Thoughts

- This section focuses on the student's current abilities
  - Do not limit expectations to these current abilities
  - Development of adaptations, modifications, & assistive technology should move the student independence and learning beyond current abilities
- Continue to evaluate the learning process and what can assist the student in moving forward

Lesson Plan

- Standards for all students:
    - Interpret data presented in a variety of ways
    - Interpret data from a variety of sources

- Learning Outcomes for all students:
    - Predict and explain based on current knowledge
    - Locate data
    - Graph data using a cluster bar graph
    - Interpret and summarize information from graph
- Learning Outcomes prioritized for Carlos:
    Record in section IIIb
    - Identify pictures related to the topic
    - Select a graph from a group of three graphics
    - Identify if bar goes up or down
    - Use communication board with voice output to share information from the graph
- Instructional Activities:
    - Discussion about auto racing
    - Search provided web sites for additional information on auto racing, specifically Indy Racing
    - Locate data on speeds and finishing times over the years on web site
    - Record data from the web site over the years
    - Instruction on creating a cluster bar graph
    - Graph collected data
    - Interpret and summarize data, answering the following questions:
        - What trends are shown? Explain possible trends
        - Were there any spikes in the data? Explain possible reasons
        - What other types of graphs could be used to represent this data?
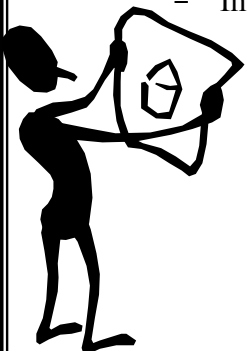
Environment

- List the standard in section II
- 8th grade math enrichment class
    - wheelchair with tray
    - communication device on tray
    - chair up to table with peers
- Supports
    - General ed. Teacher and Associate assist all students
   - Peers assist Carlos, but do everything for him

III. Instructional Activity (Task)

a. Areas of concern in accessing curriculum
    - Receptive & expressive communication
    - Computer access
b. Opportunities to move toward mastery:
    - Concepts and learning outcomes are simplified for Carlos
    - Hands on activities are easier for Carlos to participate
    - Watching a video or animated computer program gets his attention and he will respond
    - Work on IEP objectives of:
        - Identifying picture symbols
        - Following verbal or pictorial directions
        - Matching shapes
        - Communicating using his voice output device
c. UDL is used when the teacher does group active learning instruction
    - AMAT currently used:
        - Voice output
        - Name stamp
        - Picture symbols
d. There is quite a bit of paper work and most people helping just do it for him. He needs to work more independently. Focus is on completion rather than learning.

Tools Brainstorming Process

Each of the guiding questions was reviewed with information from the Student, Environment, and Task section:

- He could use his communication board to participate in class discussions and answer questions, however it takes up his entire tray so there is no room for other materials and it makes it hard for him to propel his own chair. The occupational therapist will be asked about a mount for the board.
- He will need to be able to access information from the web site
  - o Options would be to have peer help with that part.
  - o Giving him objects to choose from to direct the peer will increase his active participation: Miniature NASCAR and Indy car can be brought in along with a choice of colors and numbers to select a particular car.
- He will need to be able to collect, graph, and answer questions about data
  - o He could use a built up marker stamp to stamp at a designated area on an enlarged graph
  - o He could be assisted hand over hand in completing the chart
  - o He could color in a car on Paint using an adapted keyboard
  - o He could be provided textured graphs
  - o He could use an adapted keyboard to enter the number in a program and have assistance in graphing
  - o He could use an adapted keyboard along with a program such as Writing With Symbols or IntelliTalk to answer questions from graph
  - o He could match the miniature cars to picture symbols of cars
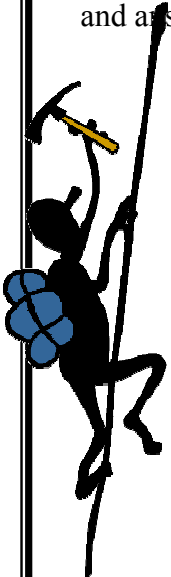
Tools

The team looked at the features of adapted keyboards on Abledata.com and liked both the
- Flexiboard by Zygo (Zygo-usa.com)
- IntelliKeys by IntelliTools (Intellitools.com)

The team decided to go with IntelliKeys because the district had one that could be used on a trial basis before purchasing. It will be used along with a program the software by the same company to allow Carlos to:
- enter the number into a chart
- answer questions about the chart

The team considered using the built up marker and thought that it would be good to use this strategy along with the computer because he could practice it more often.

The team decided that hand over hand assistance did not help Carlos move closer to learning about numbers, graphing, and reading a graph.

The team decided to bring in as many objects to represent the activity as possible to motivate Carlos and help make the information more concrete.

His questions regarding the data will be simplified and choices will be given to him on the IntelliKeys board so that he can "type" his answers and print out.
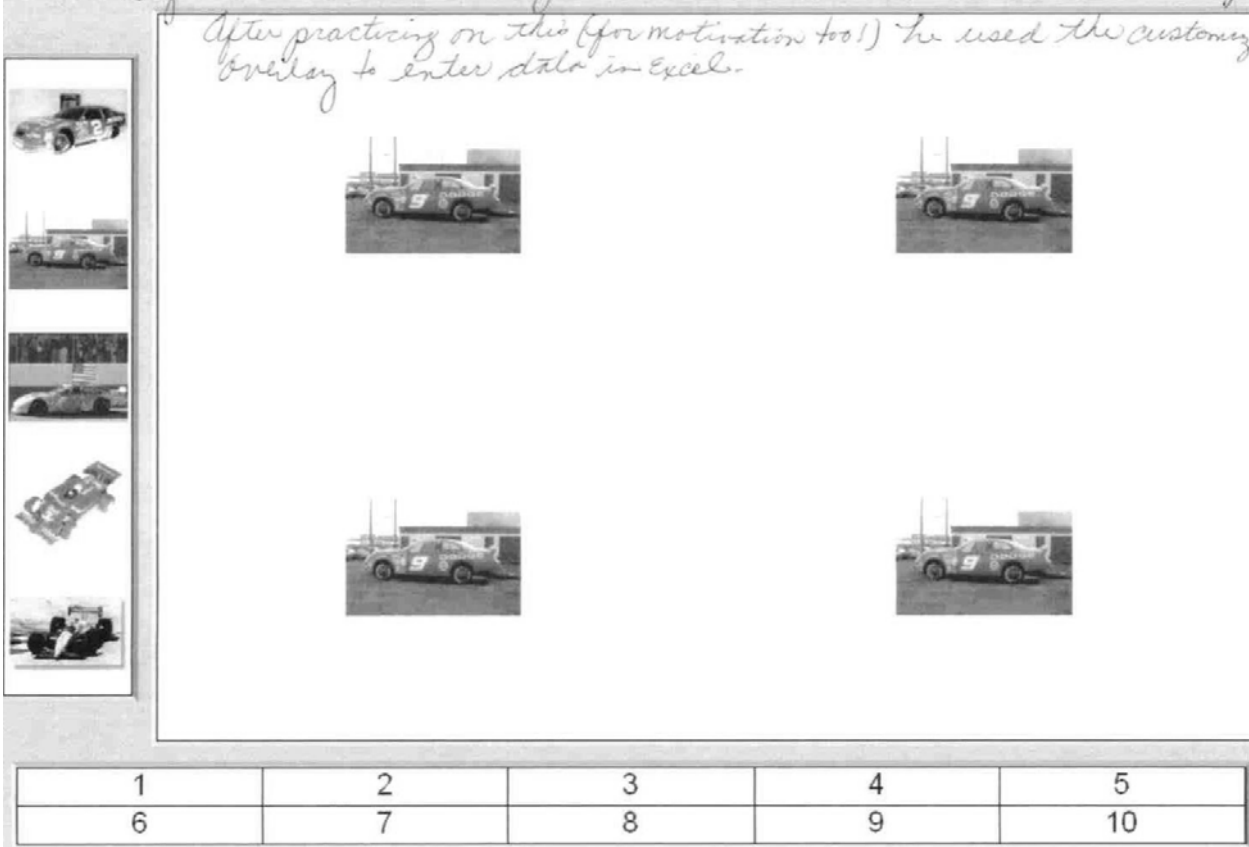
Since Carlos' prioritized learning outcomes are:
- Identifying pictures related to topics, he will match the miniatures to pictures and then work on identifying the pictures from a choice of three
- Identifying if bar graph goes up or down, he will be presented with a variety of bar graphs (including textured ones and possibly one with actual objects in a grid) to practice the concept
- Use communication board to share information, he will use his communication board and the IntelliKeys to talk about the math activity

The speech therapist is going to train the staff on the use of the adapted keyboard.

Carlos' Work Samples

Carlos practiced using the custom overlay with numbers 1-10 used on IntelliKeys. He would select a key that was the number he was asked to push. After practicing on this (for motivation too!) he used the customized overlay to enter data in Excel.

1	2	3	4	5
6	7	8	9	10

☊ Practice activity for of overlay used to collect data for math activity and to provide motivation.
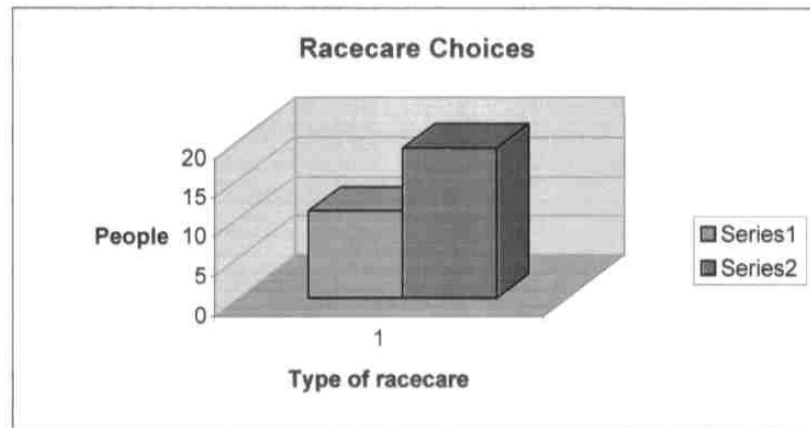
➲ Customized overlay used to collect data and enter into computer program. Teacher note records his independent use at 82%

Carlos customized overlay. He used it independently (touched key to enter into the comp) with 82% accuracy.

1	2	3
4	5	6
7	8	9

Indy	Nascar
2	4
2	3
5	5
2	7
11	19

Carlos

Racecare Choices

People

20
15
10
5
0

1

Type of racecare

Series1
Series2

Carlos used his adapted keyboard with custom overlay (numbers 1-10). While his peers collected data from the internet he collected data by asking students & teachers their preference of type of auto racing (Nascar or Indy). He would press the number to enter it into excel while a peer clicked on cells + set up graph.

He was asked which was mo

ᴖ Print out of the Excel data and chart that Carlos and a peer completed. Carlos used his customized keyboard overlay to enter the data.